

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED.

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1212703 JIV report S/N: 00665

(Note: As practicable as possible the JIT report is to be signed in the field by all the participating parties)

A. GENERAL INFORMATION:

1. Spill incident Number: 1212703 2. Type of incident* OIL SPILL
 3. Name of Location 6" TUNU WELL-GT FLOWLINE
 4. Name of nearest community EGBEMO-ANGALABIRI 5. State: BAYELSA 6. LGA EKEREMOR
 7. Type of Production facility/Installation FLOWLINE 8. Asset owner/District SWAMP WEST/TUNU

B. INCIDENT INFORMATION:

9. Details of incident
 a. Date of incident: 11TH JULY, 2014
 b. Start date/time of investigation: 23RD JULY, 2014 AT 1130HRS
 c. Investigation End date: 3RD AUGUST, 2014 Actual investigation duration, days: 2 DAYS
 d. Description of spill point environment

- | | | |
|---|--|--|
| <input type="checkbox"/> Firmed soil | <input type="checkbox"/> Loose soil | <input type="checkbox"/> Recently excavated area |
| <input checked="" type="checkbox"/> Under water | <input checked="" type="checkbox"/> Swampy | <input type="checkbox"/> Exposed pipe surface |
| <input type="checkbox"/> Well Platform (on Water) | | <input type="checkbox"/> Drill Rig |

Additional observations around the spill point: UPON LIFTING THE FLOWLINE, THE JOINT INVESTIGATION TEAM OBSERVED A RUPTURE (TEAR - 31 CM X 5 CM) ON THE FLOWLINE AT 6 O'CLOCK POSITION. AND IT WAS BULGING OUTWARD.

- e. Description of leak point (tick as applicable):
- | | | |
|---|---|---|
| <input type="checkbox"/> Drilled hole | <input type="checkbox"/> Hack saw cut | <input checked="" type="checkbox"/> Tear (<u>31 CM X 5 CM</u>). |
| <input type="checkbox"/> Complete Rupture | <input type="checkbox"/> Inward dent, | <input type="checkbox"/> Well head tampering |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve, | <input type="checkbox"/> Failed Clamp | <input type="checkbox"/> Missing Pipeline/Flowline |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point, | | <input type="checkbox"/> Third party tampering with Clamp |
| <input type="checkbox"/> Third party tampering with valve setting, | | <input type="checkbox"/> Third party tampering with flange, |
| <input type="checkbox"/> Corrosion | <input type="checkbox"/> Saver-pit over flow, | <input type="checkbox"/> Surge vessel overflow, |
| <input checked="" type="checkbox"/> Bulging Outward | <input type="checkbox"/> Flare System/Bund wall failure | <input type="checkbox"/> Accidental 3 rd party equipment |
| impact | <input type="checkbox"/> Valve Failure | <input type="checkbox"/> com unit failure |
| <input type="checkbox"/> Relief valve failure | <input type="checkbox"/> Others (specify) _____ | <input type="checkbox"/> Cold vent |

- f. Incident caused by:
- Third party interference (Sabotage ; crude theft ; Line theft ; Accidental 3rd party damage)
 Operational Others (including Mystery spills) _____

*This can be: a) Oil Spill b) Drilling fluid/Chemical c) Situation d) construction e) Encroachment f) Fire.

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g. Spill point coordinates

Measuring unit (M)	
Northings:	Easting:
<u>97543.30</u>	<u>354570.74</u>

MINNA (WEST - BELU)

C. RISK ASSESSMENT

10. Type of environment:

- Land
 Swamp
 Water
 Seasonal swamp
 Shoreline/Waterfront

i. Type of environment to which oil has spread:

- Land
 Swamp
 Water
 River (identify) _____

ii. Weather condition

- Rain
 Sunny
 Dry
 Wet
 Windy
 Hot
 Cool

11. Distance from the nearest sensitive habitat

- Government reserved and designated protected area [,m]
 Drinking water source [,m]
 Built up area [,m]
 Farmlands [,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]
 Others (specify). [,m]

NONE WITHIN THE VICINITY

12. Containment measures put in place:

- Booms
 Trench
 Dyke
 Natural depression
 Pit
 None
- Others: _____

13. Any pictures or video coverage? [N]

14. Further response/repair initiated as at the time of JIV? [Y]

If yes to item 14, give brief description: REPAIR IS BEING PLANNED BY ARGET ENGINEERING.

15. Was there any disruption to the investigation? [Y]

If yes to item 15 give brief description: NOT APPLICABLE

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D. TYPE/NUMBERS OF PROPERTIES, IF ANY, FOUND WITHIN THE AREA OF SPREAD OF OIL

16. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments
NONE WITHIN AREA OF IMPACT					

17. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1.	PINEAPPLE	14	17	20	51	/
2.	STUMPS	2			2	
3.	MANGROVE	FEW	FEW	FEW	FEW	

18. Fish/Nets/Ponds

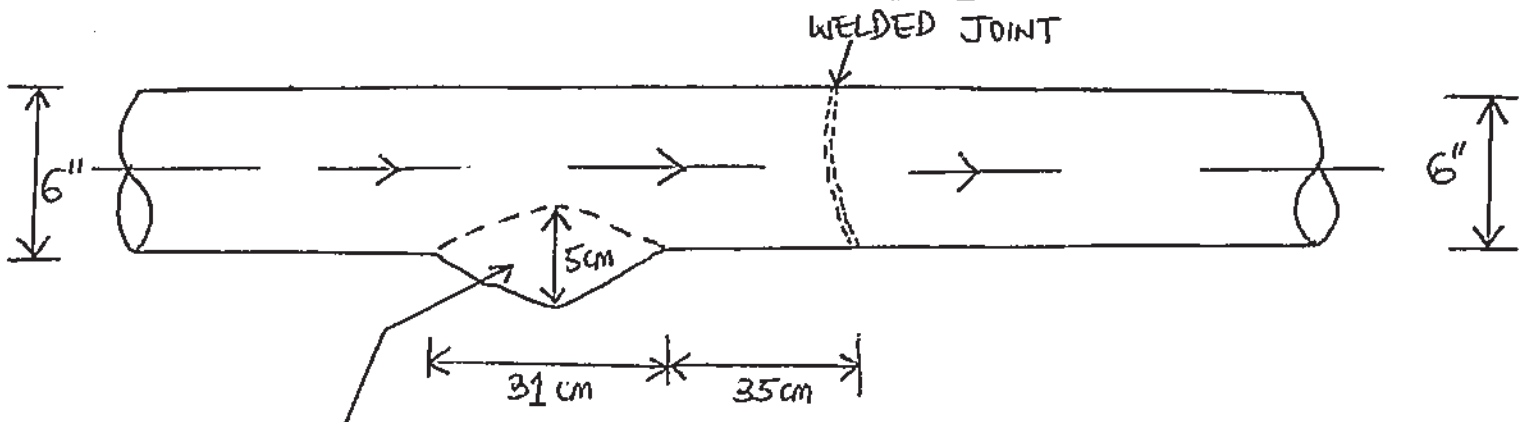
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
1.	FISH NET	OIL STAINED FISH NETS	7	OIL STAINED FISH NETS
/				

19. Others (Specify) i.e. Animal Traps

S/N	Others	Description	Quantity/Size	Comments
NONE WITHIN AREA OF IMPACT				

E. GRAPHIC DESCRIPTION OF LEAK POINT (while detail report of the leak point should be contained in the leak report, overview sketch of the site should be added as an appendix 1)

SECTION OF 6" TUNN WELL - 6T FLOWLINE SHOWING; POSITION OF FLOWLINE RUPTURE (TEAR) AT 6 O'CLOCK POSITION.



FLOWLINE RUPTURE (TEAR) AT 6 O'CLOCK POSITION

ESTIMATION OF OIL SPILL VOLUME

A OIL SPILLED ONSHORE/OFFSHORE (Leak stopped at source)

Impacted Area Details

Total Calculated Area of Impact

50,600.00 m²

i Impact within SPDC R.O.W

m²

ii Impact outside SPDC R.O.W

m²

1 Volume of oil recovered before completion of JIV (V_{rec})

i Estimated Recovered oil (Net)

m³

Estimated Recovered oil (Net) V_{rec} 0.00 bbls

2 Computation of estimated residual volume on site

a Computation of volume of free phase oil (on land or confined water body)

i Total area occupied by pool of free phase oil

m²

ii Average depth of pool of free phase oil

m

iii Emulsification factor (If applicable, else 0%)

%

Estimated Volume of pool of free phase oil, V_{pool} 0.00 m³

Estimated Volume of pool of free phase oil, V_{pool} 0.00 bbls

b Computation of estimated volume of infiltrated oil in the soil (V_{inf})

1 Volume of infiltrated oil at spill point (V_{inf s})

i Total area covered by the oil (infiltration)

m²

ii Average depth of infiltration above leaking facility i.e. pipeline/flowline

m

iii Soil type

Clay

iv P_e (effective porosity of the soil)

8%

v Cause of spill

Operational

vi Calculation of days for infiltration below the leaking point on pipeline or flowline

Incident Date	JIV Date	Days on Site
7/11/2014 13:40	7/23/2014 14:45	12
If 'cause of spill' is operational, use 1 week as worst case scenario except where 'days on site' exceeds 7.		7

Infiltration of oil types in various soil types vs time.			
Soil type	Approximate time to reach 1m depth below ground level		
Oil type	Sand	Loam	Clay
Bonny Medium	3 weeks	3 years	> 10 years
Bonny Light	2 days	2 months	> 10 years

vii Oil type

Bonny Medium

viii Average depth of infiltration below leaking facility i.e. pipeline/flowline

0.003 m

ix Total depth below ground surface of infiltration of oil

0.003 m

Estimated Volume of infiltrated oil, V_{inf s} 0.00 m³

Estimated Volume of infiltrated oil, V_{inf s} 0.00 bbls

2 Volume of infiltrated oil at second spill point (If applicable) (V_{inf b})

i Total area covered by the oil (infiltration)

m²

ii Average depth of infiltration above leaking facility i.e. pipeline/flowline

m

iii Soil type

Clay

iv P_e (effective porosity of the soil)

8%

v Average depth of infiltration below leaking facility i.e. pipeline/flowline

0.003 m

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G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 5.06 Hg
- Impact within SPDC R.O.W YES
- Impact outside SPDC R.O.W YES

21. Volume of oil recovered before completion of JIV (V_{rec}):

Recovered oil V_{rec} :	<u>NIL</u>	Barrels
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Controlled recovery/evacuation from source with no impact to environment:

<u>NIL</u>	Barrels
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22. Net Estimated Spilled Volume V_{ES} (bbls)* =	<u>45.96 BBLs</u>
Estimated Reported Volume** V_{ER} (bbls) =	<u>46 BBLs</u>

*Notes:

- Volume estimation was done using an excel based tool. (see attached for details on the calculation)
- Reported spilled volume is an estimate

Write other relevant notes taken into consideration for estimating the spilled in the box below:

Calculation of the respective estimated volume is to be done on site as far as practicable using the new spill volume estimation software on site; Conversion of m³ to barrels is Volume (m³) x 6.29; **Round up estimated volume to next whole number using the following rules:

- Any spill volume in excess of 1 bbl is rounded up to the next whole number.
- Any spill volume in less than 1 bbl is rounded up to the next 0.1 bbl.

Examples: Calculated volume = 15.3 bbl ----- Reported volume = 16 bbl
 Calculated volume = 0.35 bbl ----- Reported volume = 0.4 bbl
 Calculated volume = 0.01 bbl ----- Reported volume = 0.1 bbl.

Wherever this estimation tool is not applicable please refer to paragraph 6c (Deviations) of the JIV procedure to use appropriate steps for column estimation; record the calculation in a plain sheet of paper and attach to the JIV report.

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23. GENERAL STATUS OF THE SITE

A. Joint investigation of the incident site found that there is no residual impact after the initial response and JIT therefore recommend that the site be closed out <input type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

24. REPRESENTATIVES

This report was filled, agreed and signed by the following joint investigation representatives:

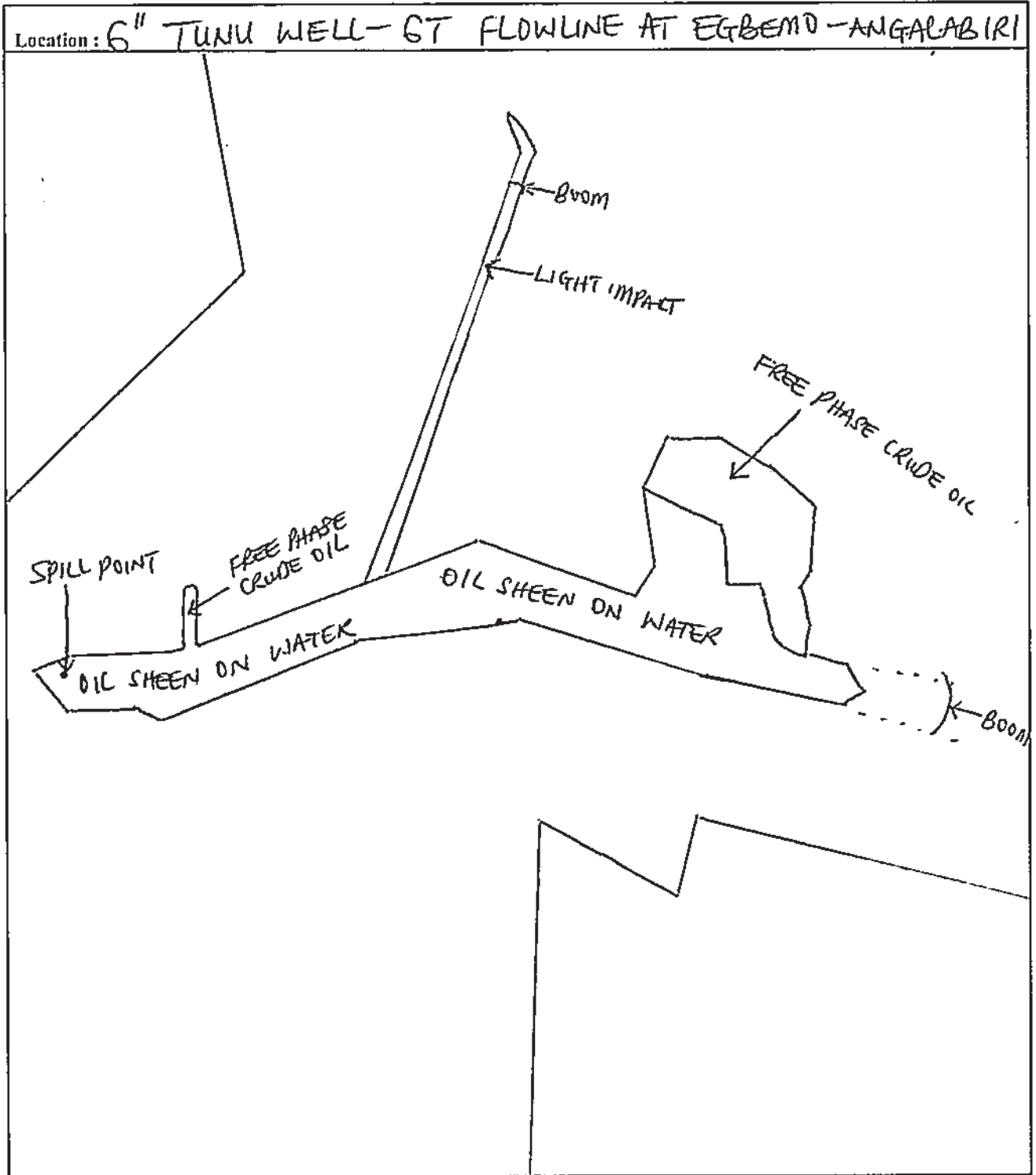
- Host Community:
- Department of Petroleum Resources [DPR]:
- National Oil Spill Detection and Response Agency [NOSDRA]:
- State Ministry of Environment [SME]:
- Nigeria Police Force [NPF]:
- Shell Petroleum Development Company [SPDC]:
- Signatories agree with reported findings:
- Separate DPR form has been filled out with same findings

Tick as applicable

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25. Appendix 1: Overview sketch of the site




MINNA (WEST-BELT)

Point	EAST	NORTH	REMARKS
SP	354570.74	97543.3	SPILL POINT
4	355223.87	97556.67	IMPACT BOUNDARY
5	355199.11	97621.13	IMPACT BOUNDARY
6	355189.8	97661.05	IMPACT BOUNDARY
7	355180.55	97667.17	IMPACT BOUNDARY
9	355140.46	97691.68	IMPACT BOUNDARY
10	355100.41	97691.61	IMPACT BOUNDARY
11	355089.57	97660.61	IMPACT BOUNDARY
12	355094.38	97608.67	IMPACT BOUNDARY
13	354918.67	97669.81	IMPACT BOUNDARY
14	354820.17	97617.43	IMPACT BOUNDARY
15	354795.49	97604.25	IMPACT BOUNDARY
16	354683.44	97548.32	IMPACT BOUNDARY
17	354688.86	97585.09	IMPACT BOUNDARY
18	354680.52	97586.02	IMPACT BOUNDARY
19	354668.52	97541.32	IMPACT BOUNDARY
21	354552.26	97544.84	IMPACT BOUNDARY
22	354558.61	97517.06	IMPACT BOUNDARY
23	354611	97509.12	IMPACT BOUNDARY
24	354638.78	97492.45	IMPACT BOUNDARY
25	354770.55	97555.16	IMPACT BOUNDARY
26	354895.96	97614.69	IMPACT BOUNDARY
27	354961.88	97626.88	IMPACT BOUNDARY
28	355026.61	97602.42	IMPACT BOUNDARY
29	355156.31	97542.46	IMPACT BOUNDARY
30	355242.42	97516.77	IMPACT BOUNDARY
31	355273.21	97529.11	IMPACT BOUNDARY
32	355260.85	97547.52	IMPACT BOUNDARY
33	355242.36	97550.56	IMPACT BOUNDARY
34	355208.42	97581.22	IMPACT BOUNDARY
40	354856.27	97604.37	IMPACT BOUNDARY
41	354810.23	97574.21	IMPACT BOUNDARY
42	354905.42	97665.37	IMPACT BOUNDARY
43	354997.1	97647.11	IMPACT BOUNDARY
44	355103.46	97632.03	IMPACT BOUNDARY
45	355094.33	97731.25	IMPACT BOUNDARY
46	355141.96	97731.25	IMPACT BOUNDARY
47	355080.05	97693.15	IMPACT BOUNDARY
48	355177.68	97719.34	IMPACT BOUNDARY
49	355210.22	97661.4	IMPACT BOUNDARY
50	355208.24	97680.05	IMPACT BOUNDARY
51	355220.54	97623.3	IMPACT BOUNDARY
52	355219.34	97603.85	IMPACT BOUNDARY
53	355228.87	97581.23	IMPACT BOUNDARY
54	355112.05	98065.55	IMPACT BOUNDARY

55	354571.48	97555.7	IMPACT BOUNDARY
992	355199.14	97602.7	IMPACT BOUNDARY
993	355089.14	98031.23	IMPACT BOUNDARY
994	355096.28	98027.1	IMPACT BOUNDARY
995	355115.22	98051.01	IMPACT BOUNDARY
996	355118.26	98072.52	IMPACT BOUNDARY
997	355115.16	98084.8	IMPACT BOUNDARY

Jonathan Obasohan

 03.08.2014.